

**APRISTURUS MELANOASPER, A NEW SPECIES OF
DEEP-WATER CATSHARK FROM THE NORTH ATLANTIC
(CHONDRICHTHYES: CARCHARHINIFORMES: SCYLIORHINIDAE)**

by

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ABSTRACT. - A new deep-water catshark, *Apristurus melanoasper* n. sp., is described based on 53 specimens from the North Atlantic Ocean at 512 to 1520 m depth. This new species is characterized by having longer upper labial furrow than the lower one, high count of spiral intestine valves, a long abdomen, large dermal denticles and black coloration of the body. Among the species of the North Atlantic, this new species is most similar to *A. laurussonii*, but is distinguishable by combination of the following characters: an interorbital space which is 1.9 to 3.5 times eyes horizontal diameter, interspace between pectoral fin tip and pelvic fin which is 1.3 to 2.5 times pectoral fin width, large dermal denticles giving very rough texture to the skin, and black body colouration. A mitochondrial DNA sequence of 1500 nucleotides of the species presents 28 differences when aligned with that of *A. laurussonii*.

RÉSUMÉ. - *Apristurus melanoasper*, une nouvelle espèce d'holbiche de profondeur de l'Atlantique Nord (Chondrichthyes: Carcharhiniformes: Scyliorhinidae).

Une nouvelle espèce d'holbiche de profondeur, *Apristurus melanoasper* sp. nov., est décrite à partir de 53 spécimens de l'océan Atlantique Nord, capturés entre 512 et 1520 m de profondeur. Cette nouvelle espèce se caractérise par des sillons labiaux supérieurs plus long que les inférieurs, un nombre élevé de tours dans la valvule spirale, un abdomen long, de grands denticules dermiques et une coloration noire du corps. Parmi les espèces de l'Atlantique Nord, *Apristurus laurussonii* est l'espèce la plus proche, mais elle s'en distingue par la combinaison des caractères suivants : espace interorbitaire 1,9 à 3,5 fois plus grand que le diamètre horizontal de l'œil, espace entre l'extrémité des nageoires pectorales et les nageoires pelviennes 1,3 à 2,5 fois plus grand que la largeur des nageoires pectorales ; grands denticules dermiques donnant une texture très rugueuse à la peau et coloration du corps noire. Une séquence de l'ADN mitochondriale de 1500 nucléotides de cette espèce présente 28 différences lorsqu'elle est alignée avec la séquence d'*A. laurussonii*.

Key words. - Scyliorhinidae - *Apristurus melanoasper* - AN - mtDNA - New species.

The genus *Apristurus* Garman, 1913 comprises a group of deep-water catsharks, inhabiting continental slopes and submarine elevations at depths of 500 to 2100 m in all oceans except polar waters. With 32 species currently recognized as valid from the world oceans, this is one of the most diverse genera of living sharks.

Forty one nominal species are known, and taxonomic revisions have been made by Springer (1966, 1979), Nakaya (1975, 1991), Cadenat and Blache (1981), Compagno (1984, 1988), Nakaya and Séret (1989, 1992), Nakaya and Sato (1998, 1999, 2000), Last and Stevens (1994) and Iglésias and Nakaya (2004). However, taxonomic confusion still exists for the genus, because many species appear very similar in external morphology and study material is lacking for many species.

Development of deep-water commercial fisheries since about fifteen years and recent deep-water scientific investi-

gations in eastern North Atlantic and western South Pacific Oceans have revealed 3 new species from these areas: *A. albisoma* Nakaya & Séret, 1999 from off New Caledonia; *A. exsanguis* Sato, Nakaya & Stewart, 1999 from off New Zealand; and *A. aphyodes* Nakaya & Stehmann, 1998 from off western Europe. Eight species of *Apristurus* are actually recognized in the North Atlantic: *A. aphyodes* Nakaya & Stehmann, 1998; *A. canutus* Springer & Heemstra, 1979, in Springer, 1979; *A. laurussonii* (Saemundsson, 1922); *A. manis* (Springer, 1979); *A. microps* (Gilchrist, 1922) *sensu* Compagno, 1984; *A. parvipinnis* Springer & Heemstra, 1979, in Springer, 1979; *A. profundorum* (Good & Bean, 1896) in Good & Bean, 1896; and *A. riveri* Bigelow & Schroeder, 1944. Among these materials from deep-water surveys in the North Atlantic Ocean, we found specimens being obviously different from congeners, and we describe them here as a new species of the genus *Apristurus*.

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MATERIALS AND METHODS

Institutional acronyms follow Leviton *et al.* (1985), except MHNLR for Muséum d'Histoire naturelle de La Rochelle. Morphometric measurements were adapted from Bigelow and Schroeder (1948), and Nakaya and Stehmann (1998), vertebral count and terminology follow Springer and Garrick (1964). Vertebral counts were determined from X-rays for *Aristurus melanoasper* n. sp., and from X-rays and dissection for *A. laurussonii*. Egg capsule terminology follows Cox (1963), and Gomes and Carvalho (1995). Clasper terminology follows Compagno (1988). Dermal denticles were collected from the dorsolateral side of the body below the first dorsal fin; they were photographed by scanning electron microscope (SEM) in the CIME, University of Jussieu. Sexual maturity stages follow Nakaya and Stehmann (1998) and Stehmann (2002). For the molecular analysis, the genomic DNA was obtained using the rapid extraction with CTAB (Jones, 1953). Amplification follows standard PCR protocol. The PCR primers were:

Chon-Mito-S-005 (5'-AGGCAAGTCGTAACATGGTAAG-3'),
Chon-Mito-R-017 (5'-ATCCAACATCGAGGTCGTAAACC-3').

The sequencing primers were:

Chon-Mito-S-005, Chon-Mito-R-017,
Chon-Mito-S-003 (5'-TCTCTGTGGCAAAGAGTGG-3'),
Chon-Mito-S-007 (5'-CACTGAYAAATTAACRAHCCCA-3'),
Chon-Mito-R-008 (5'-CCACTCTTTTGCCACAGAGA-3'),
Chon-Mito-S-009 (5'-CACGAGAGTTAACTGTCTCT-3'),
Chon-Mito-R-010 (5'-TAGAGACAGTTAACTCTCGT-3').

The sequences were obtained manually by the Sanger's techniques and alignment was checked by hand. The mitochondrial DNA sequences are 1500 bp long and are composed of partial 12S rRNA (24 bp), complete Valine tRNA (73 bp) and partial 16S rRNA (1403 bp). Sequences are available online under the GenBank accession numbers: AF329374 for *Aristurus melanoasper* n. sp. (specimen MNHN 2000-1755) and AF329376 for *A. laurussonii* (specimen MNHN 2000-1745).

APRISTURUS MELANOASPER N. SP.

Aristurus sp. - Quéro *et al.*, 2003: p. 25; photo, plate 2.

English common name: black roughscale catshark;

French common name: holbiche noire.

Holotype. - MNHN 2000-1757, mature male, 718 mm total length (TL), caught by bottom trawl, "Croix-Morand-03" cruise, station 26, on the commercial trawler "Croix-Morand", 15 Mar. 2000, Lorient Bank, 54°21.5'-54°22.0'N, 19°28.1'-19°44.4'W, 1243-1260 m depth.

Paratypes (24 specimens: 20 from eastern North Atlantic, 4 from western North Atlantic).

MNHN 1999-0780, mature male, 658 mm TL, 2 Jul. 1997,

Lorient Bank, 54°20'N, 19°30'W, 1200-1250 m; MNHN 1999-0782, mature female with one egg capsule, 661 mm TL, 24 Oct. 1997, Malin Slope, 55°40'N, 9°30'W, 1200 m; MNHN 1999-0783, mature female, 640 mm TL, 25 Apr. 1999, Malin Slope, 56°14.6'-56°18.0'N, 9°20.3'-9°19.6'W, 989-1020 m; MNHN 2000-1754, mature female with one egg capsule, 732 mm TL, 14 Jul. 1999, Hebrides Slope, 58°10.0'-58°27.0'N, 9°34.2'W, 1170-1300 m; MNHN 2000-1755 and 2000-1756, mature female and immature male, 670 and 340 mm TL respectively, 15 Mar. 2000, Lorient Bank, 54°20.7'-54°24.1'N, 19°43.1'-19°28.0'W, 1230-1256 m; MNHN 2000-1758, immature male, 593 mm TL, 15 Mar. 2000, Lorient Bank, 54°21.5'-54°22.0'N, 19°28.1'-19°44.4'W, 1243-1260 m; MNHN 2000-1759 and 2000-1760, mature males, 715 and 685 mm TL respectively, 16 Mar. 2000, Lorient Bank, 54°20.2'-54°17.8'N, 19°44.0'-19°28.8'W, 1230-1250 m; MNHN 2000-1761, 2000-1762 and 2000-1763, two mature males and immature female, 761, 720 and 502 mm TL respectively, 16 Mar. 2000, Lorient Bank, 54°19.9'-54°16.9'N, 19°44.7'-19°31.6'W, 1230-1249 m; MNHN 2000-1764, mature female, 620 mm TL, 17 Mar. 2000, Lorient Bank, 54°16.3'-54°19.2'N, 19°37.8'-19°53.0'W, 1240-1248 m; MNHN 2000-1765, 2000-1766 and 2000-1767, mature male, immature male and immature female, 739, 576 and 398 mm TL respectively, 17 Mar. 2000, Lorient Bank, 54°17.6'-54°13.5'N, 19°52.3'-19°31.8'W, 1267-1270 m; MNHN 2000-1768, immature female, 428 mm TL, 7 May 2000, Malin Slope, 59°06'N, 7°06'W, 1320 m; MNHN 2001-1111, mature female, 711 mm TL, 12 Mar. 2001, Malin Slope, 56°22'N, 9°30'W, 1100 m; ISH 26/1974, mature female, 710 mm TL, 8 May 1974, Lousy Bank, 60°03'N, 13°25'-13°12'W, 804 m; ISH 49/1974, mature male, 677 mm TL, 10 May 1974, Bill Bailey's Bank, 61°06'N, 11°30'W, 1254-1262 m; ARC 8602997, two maturing males and maturing female, 616, 618 and 584 mm TL respectively, 30 Oct. 1978, Slope off Nova Scotia, 42°50'N, 62°03'W, 950 m; MCZ 125408, mature male, 692 mm TL, 13 Nov. 1994, Slope off New Jersey, 39°17'N, 72°11'W, 512-662 m.

Non-types (28 specimens: 9 from eastern North Atlantic, 19 from western North Atlantic).

MNHN 1999-0781, mature female, 570 mm TL, 2 Jul. 1997, Lorient Bank, 54°20'N, 19°30'W, 1200-1250 m; ISH 830/1974, two immature males and maturing male, 401, 470 and 512 mm TL respectively, 9 Dec. 1974, Goban Spur, 49°07'N, 12°15'W, 1500 m; ISH 3411/1979, immature males, 333, 412, 454 and 465 mm TL, 26 Oct. 1979, Slope off New Jersey, 39°50'N, 70°55'W, 1004-1008 m; ISH 3711/1979, maturing male, 563 mm TL, 14 Nov. 1979, Slope off New Jersey, 39°46.3'N, 71°33'W, 824-844 m; ISH 3693/1979, immature female, 413 mm TL, 14 Nov. 1979, Slope off New Jersey, 39°46'N, 71°28'W, 1000-1016 m; ISH 3694/1979, immature male and immature female, 256 and 243 mm TL respectively, 14 Nov. 1979, Slope off New Jersey, 39°46'N, 71°28'W, 1000-1016 m; ISH 85/1981, immature male, 418 mm TL, 13 Oct. 1981, Malin Slope, 56°35'N, 9°38'W, 1500 m; ARC 8602997, two immature males, immature female, five maturing males, mature male and mature female, 531, 535, 399, 539, 550, 556, 577, 616, 620 and 542 mm TL respectively, 30 Oct. 1978, Slope off Nova Scotia, 42°50'N, 62°03'W, 950 m; MCZ 125407, maturing female, 516 mm TL, 13 Nov. 1994, Slope off Nova Scotia, 39°37'N, 71°52'W, 567-827 m; IOS 52106, immature male and maturing male, 422 and 504 mm TL respectively, 7 Nov. 1984, Porcupine Seabight, 51°36.4'N, 12°45.0'W, 1500-1520 m; MHNLR 403 and 404, maturing males, 560 and 638 mm TL respectively, 14 Jul. 1996, Malin Slope, 55°33'N, 9°52'W, 1295-1303 m.

Table I. - Proportional measurements (% of total length) of the holotype, paratypes and all specimens examined of *Apristurus melanoasper* n. sp. A = anal fin; C = caudal fin; D = dorsal fin(s); P = pectoral fin(s); V = ventral fin(s). [Mesures proportionnelles (% de la longueur totale) de l'holotype, des paratypes et de tous les spécimens d'*Apristurus melanoasper* n. sp. examinés. A = nageoire anale ; C = nageoire caudale ; D = nageoire(s) dorsale(s) ; P = nageoire(s) pectorale(s) ; V = nageoire(s) ventrale(s).]

Measurements	TL (mm)	Holotype	Paratypes			All specimens examined		
		718	340 - 761			243 - 761		
	Sex (n)	Male	Males (13) - Females (11)			Males (36) - Females (17)		
			Range	Mean \pm SD	n	Range	Mean \pm SD	n
1 Snout tip to anterior nostril		3.8	3.4 - 5.0	4.0 \pm 0.4	24	3.4 - 5.4	4.1 \pm 0.4	53
2 Snout tip to posterior nostril		5.8	5.3 - 7.2	6.4 \pm 0.6	24	5.3 - 9.3	6.8 \pm 0.8	53
3 Snout tip to mouth		7.7	7.0 - 9.4	8.1 \pm 0.8	24	7.0 - 11.0	8.6 \pm 1.0	53
4 Snout tip to eye		8.2	7.8 - 10.3	9.0 \pm 0.8	24	7.8 - 12.9	9.7 \pm 1.2	53
5 Snout tip to 1st gill opening		16.4	14.9 - 19.8	17.1 \pm 1.3	24	14.9 - 22.2	18.2 \pm 1.7	53
6 Snout tip to 5th gill opening		19.9	18.8 - 22.9	21.0 \pm 1.1	24	18.8 - 26.0	21.9 \pm 1.5	51
7 Snout tip to cloaca		51.1	46.0 - 53.0	50.5 \pm 1.9	24	46.0 - 53.0	50.3 \pm 1.5	53
8 Snout tip to 1st D origin		49.7	43.7 - 52.1	49.4 \pm 1.8	24	43.7 - 52.1	49.2 \pm 1.5	53
9 Snout tip to 2nd D origin		64.8	57.3 - 68.3	64.1 \pm 2.4	24	57.3 - 68.3	64.1 \pm 1.9	53
10 Snout tip to V origin		48.2	41.8 - 48.8	46.1 \pm 2.1	24	41.8 - 48.8	45.6 \pm 1.8	53
11 Snout tip to A origin		58.8	51.4 - 60.2	57.4 \pm 2.0	24	51.4 - 60.2	56.8 \pm 1.9	53
12 Head width		9.9	8.7 - 12.6	10.7 \pm 1.0	24	8.7 - 14.0	11.0 \pm 1.1	53
13 Eye horizontal diameter		2.6	2.5 - 3.7	3.0 \pm 0.3	24	2.5 - 3.7	3.0 \pm 0.3	53
14 Nostril diameter		3.3	2.7 - 4.1	3.4 \pm 0.4	24	2.7 - 4.9	3.5 \pm 0.5	53
15 Mouth width		6.7	6.6 - 9.5	7.7 \pm 0.8	24	6.6 - 9.7	7.9 \pm 0.8	53
16 Internarial space		3.0	2.9 - 4.0	3.4 \pm 0.3	24	2.9 - 4.8	3.6 \pm 0.4	53
17 Interorbital space		6.0	5.4 - 7.9	6.6 \pm 0.7	24	5.4 - 8.8	6.8 \pm 0.7	53
18 Length upper labial furrow		3.7	3.0 - 3.8	3.4 \pm 0.2	24	2.8 - 4.2	3.5 \pm 0.3	52
19 Length lower labial furrow		2.0	1.7 - 2.8	2.2 \pm 0.3	24	1.6 - 2.8	2.2 \pm 0.3	53
20 Length 1 st gill opening		1.3	1.0 - 1.8	1.5 \pm 0.2	24	0.9 - 2.0	1.4 \pm 0.2	53
21 Length 3 rd gill opening		1.3	1.2 - 2.3	1.6 \pm 0.2	24	1.0 - 2.3	1.5 \pm 0.3	53
22 Length 5 th gill opening		1.3	0.8 - 1.8	1.4 \pm 0.2	24	0.8 - 1.8	1.3 \pm 0.2	53
23 Distance between D bases		8.6	7.9 - 10.7	8.8 \pm 0.8	24	5.8 - 10.7	8.5 \pm 0.9	53
24 Distance between D insertions		15.3	14.1 - 16.0	14.9 \pm 0.6	24	12.8 - 16.0	14.7 \pm 0.7	53
25 Distance between P insertion and V origin		19.5	13.0 - 21.2	18.1 \pm 2.2	24	13.0 - 21.2	17.5 \pm 2.1	53
26 Distance between P tip and V origin		15.6	10.3 - 16.0	13.1 \pm 1.9	24	7.5 - 16.0	12.4 \pm 1.9	53
27 Distance between V insertion and A origin		5.2	2.6 - 6.8	4.8 \pm 1.0	23	2.3 - 6.8	4.4 \pm 1.0	51
28 Distance between V insertion and A insertion		18.4	16.2 - 20.0	18.4 \pm 1.1	24	16.2 - 20.0	18.3 \pm 1.0	51
29 Distance between P and V origins		25.9	20.9 - 27.9	25.0 \pm 2.1	24	20.1 - 27.9	24.5 \pm 1.9	53
30 Distance between nostril and mouth		1.7	1.5 - 2.3	1.9 \pm 0.2	24	1.5 - 2.7	2.0 \pm 0.3	53
31 1 st D overall length		9.6	9.1 - 11.2	10.0 \pm 0.6	24	8.8 - 12.6	10.1 \pm 0.8	53
32 1 st D height		2.8	1.7 - 2.8	2.5 \pm 0.3	24	1.7 - 3.0	2.5 \pm 0.3	53
33 2 nd D overall length		9.6	8.7 - 10.5	9.6 \pm 0.5	24	8.7 - 11.5	9.7 \pm 0.5	52
34 2 nd D height		2.9	2.6 - 3.2	2.9 \pm 0.2	24	2.3 - 3.5	2.8 \pm 0.2	53
35 P anterior margin length		10.9	9.7 - 12.8	11.2 \pm 0.8	24	8.6 - 13.3	11.5 \pm 1.0	53
36 P width		7.1	5.8 - 7.8	6.7 \pm 0.5	24	5.8 - 7.9	6.8 \pm 0.6	40
37 V overall length		9.1	7.9 - 11.2	9.8 \pm 0.9	24	7.9 - 11.7	10.0 \pm 0.8	53
38 A base length		14.1	12.3 - 16.1	14.1 \pm 0.9	24	12.3 - 16.4	14.4 \pm 0.9	53
39 C lower margin		28.8	27.4 - 32.2	29.0 \pm 1.2	24	24.3 - 32.7	29.3 \pm 1.5	53
40 Caudal peduncle height		4.0	3.4 - 4.7	4.2 \pm 0.3	24	3.4 - 4.7	4.3 \pm 0.2	53

Diagnosis

A species of *Apristurus* with large dermal denticles giving a rough texture to the skin. Upper labial furrows longer than the lower ones. First dorsal fin only slightly smaller than the second dorsal fin, originating from above anterior third to the middle of the pelvic fin base. Second dorsal fin

insertion just before level of anal fin insertion. Interorbital space 1.9 to 3.5 times eye horizontal diameter. Abdomen between pectoral fin tip and pelvic fin origin 1.3 to 2.5 times pectoral fin width. Spiral valves in the intestine 19 to 23 (mostly 21 or 22). Monospondylous + precaudal diplospondylous vertebrae 36 to 43 + 26 to 32 (mostly 38 to 40 + 28 to

30). Body uniformly black, slightly brownish in larger specimens. No dermal denticles on tongue and palate.

Description of holotype (statements on paratypes given in parentheses only when different)

Proportional measurements and meristic counts are given in tables I-III.

Body cylindrical (Fig. 1), head dorsoventrally flattened, posterior part of body compressed laterally. Snout length moderate, its preorbital length half (0.5-0.6 in the paratypes) of distance from snout tip to first gill opening. Snout tip to anterior nostril about half (0.4-0.5) of preoral snout length, 1.2 (1.0 to 1.4) times the internarial space and 0.6 (0.5-0.7) times the interorbital space; snout tip rounded. Nostrils

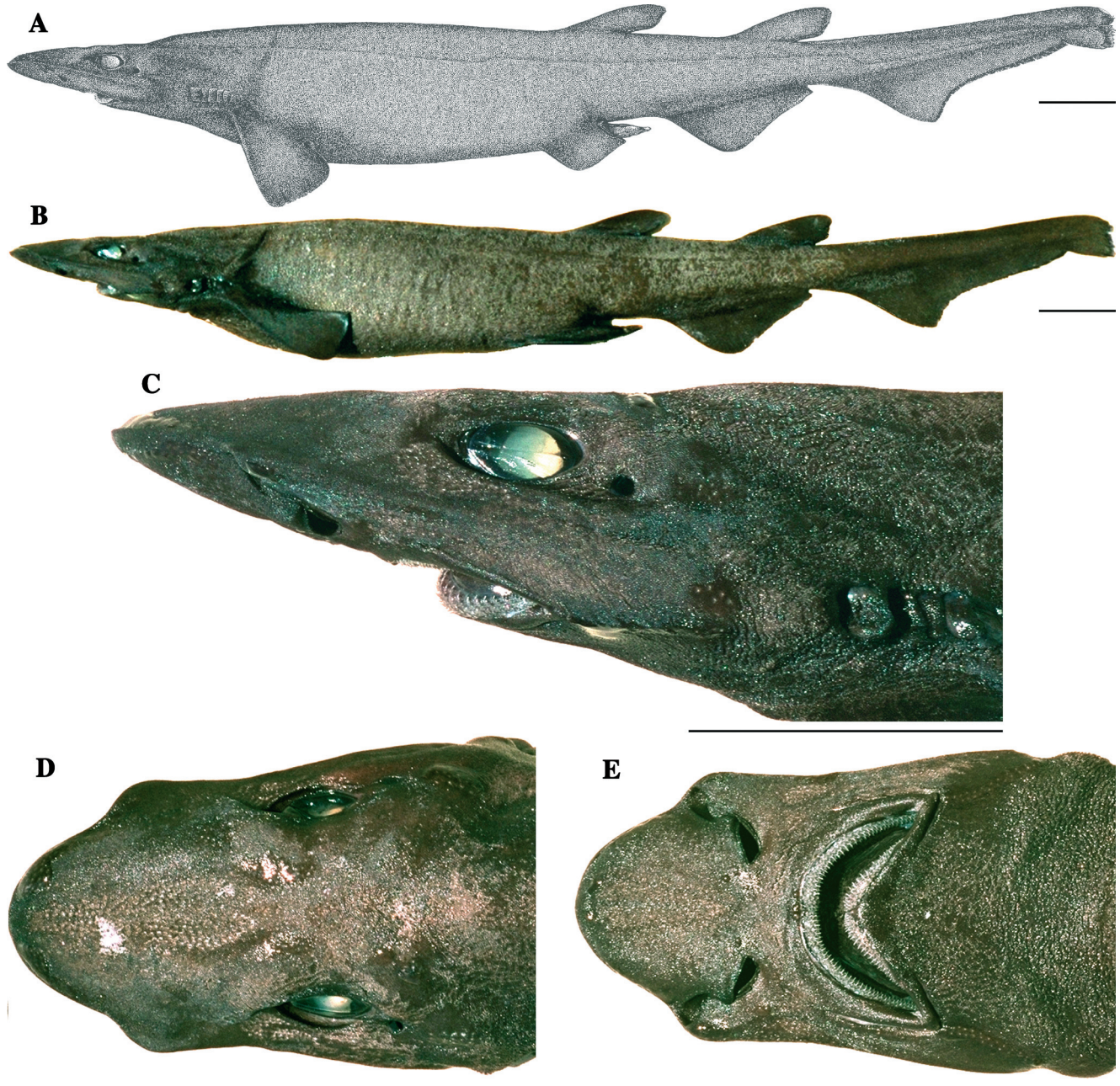


Figure 1. - *Apristurus melanoasper* n. sp., holotype MNHN 2000-1757, mature male, 718 mm TL, Lorient Bank, northern North Eastern Atlantic. **A**: Lateral view (drawing); **B**: Lateral view (photograph); **C**: Lateral view of head; **D**: Dorsal view of head; **E**: Ventral view of head. Scale bars = 5 cm. [*Apristurus melanoasper* n. sp., holotype MNHN 2000-1757, mâle mature, 718 mm TL, banc de Lorient, Atlantique Nord-Est. **A** : Vue latérale (dessin) ; **B** : Vue latérale (photographie) ; **C** : Vue latérale de la tête ; **D** : Vue dorsale de la tête ; **E** : Vue ventrale de la tête. Échelle = 5 cm.]

expanding obliquely inward from snout edges; their diameter about equal to internarial space and a little longer than horizontal diameter of eye. Distance between nostril and mouth about 1.8 times the internarial space. Mouth deeply arched, with well developed labial furrows; upper furrows much longer than the lower ones. Upper furrows longer than 50% of distance between mouth corner and posterior margin of nostril. Eye with a weak subocular fold. Spiracle small placed slightly below level of horizontal axis of eye. Five small gill openings; 5th gill opening above pectoral fin origin and the smallest. Gill septum with or without a projecting posterior medial lobe.

Abdomen very long; distance between pectoral fin tip and pelvic fin origin about 2.2 (1.3 to 2.5) times pectoral fin width, and about 1.7 (1.5 to 2.0) times pelvic fin overall length.

Pectoral fins relatively small, narrow and subquadrangular. Pelvic fins moderate in size. First dorsal fin slightly smaller than 2nd dorsal fin; its origin over anterior third to the middle of pelvic fin base, its insertion above interspace between pelvic and anal fins; second dorsal fin origin above middle of anal fin base; its insertion slightly before that of anal fin. Anal fin high, with base shorter than the distance between pectoral fin tip and pelvic fin origin; posterior margin very slightly concave. Anal and caudal fins separated only by a notch. Dorsal lobe of the caudal fin relatively slender; preventral margin concave near the caudal peduncle and convex near the tip; a distinct subterminal notch present. Caudal peduncle height about half of the preoral snout length.

Numerous pores of Lorenzini's ampullae conspicuous on dorsal and ventral surfaces of snout. First angled deviation from straight horizontal course of the lateral line distinctly in front of the first dorsal fin.

Dermal denticles from dorsolateral side of body (Fig. 2A) very large, overlapping each other, tricuspid, with medial cusp longest; outer surface of denticles completely structured by reticulations and with a single prominent medial ridge. No modified dermal denticles on the dorsal margin of the caudal fin. Dermal denticles present around the gill openings. Gill septum partially covered by dermal denticles.

Numerous small teeth (Fig. 3A) in upper and lower jaws, each with a long central cusp, flanked by one to three pairs of smaller lateral cusps. Lateral teeth with a larger number of cusps than those in the central part of the jaw. Tooth rows 39 + 41 = 80 in upper jaw and 42 + 46 = 88 in lower jaw (59 to 93 and 58 to 97 in paratypes and non-types, respectively). Teeth with some very thin striae on cusps.

Number of tours in spiral valve 22 (20-23 and 19-23 in paratypes and non-types, respectively) (Tab. II). Number of monospondylous vertebrae 40 (36-41 and 36-43 in paratypes and non-types, respectively), and of precaudal diplospondylous vertebrae 29 (26-30 and 27-32 in paratypes and non-types, respectively) (Tab. III).

Colour: Upper and lower surfaces of body and fins uniformly black. Larger specimens tend to be blackish brown, smaller ones dark grey. A very small white spot about 5 mm long present on dorsal margin of posterior tip of caudal fin, even on preserved specimens (often present in paratypes and non-types, 2 to 10 mm long). Tongue and palate black, peritoneum white. Pupils pale greenish yellow and bright; iris black, when fresh.

Claspers (Fig. 4) short and robust, tapering toward the tip; ventral and outer lateral sides covered with dermal denticles. Dorsal side of the clasper naked except for the posterior half of the exorhipidion. Inner margin of exorhipidion with dermal denticles modified into wide tricuspid clasper hooks. Clasper groove covered by rhipidions except for posterior one third. Pseudosiphon distinct as a narrow deep groove.

Egg capsule

Three egg capsules were taken from three females (Tab. IV). Egg capsule (Fig. 5) is 52-67 mm in length and 23.5-27 mm in width; posterior end with two very long and tightly coiled tendrils set closely each other at base; anterior margin of the capsule is slightly concave, with a short inwardly curving horn of about 3 mm length at each corner; a neckline constriction is located at about a third to two seventh of the length from anterior end; surface is entirely covered by numerous fine and weak longitudinal fibres; lateral edge forming keel-like ridge, with fine longitudinal striations; four respiratory fissures (two on each side) are present as grooves, respectively, on anterior-left side and posterior-left side of the capsule; capsule is opaque; khaki yellowish to brownish, and probably darker after exposure to sea water; colour of the tendrils is blackish brown.

Molecular characteristics

A 1500 bp sequence of a portion of the mitochondrial genome coding partial 12S rRNA, Valine tRNA and partial

Table II. - Frequency distribution of spiral valve count in *Apristurus melanoasper* n. sp. and *A. laurussonii*. Asterisk = holotype. Bold-faced numbers = higher frequencies. [*Distribution de fréquence des tours dans la valvule spirale d'Apristurus melanoasper* n. sp. et *A. laurussonii*. Astérisque = holotype. Nombres en caractères gras = plus hautes fréquences.]

	Spiral valve count							
	16	17	18	19	20	21	22	23
<i>A. melanoasper</i> n. sp. (EN Atlantic)				1	6	9	6*	4
<i>A. melanoasper</i> n. sp. (WN Atlantic)				3		4	10	5
<i>A. melanoasper</i> n. sp. (total)				4	6	13	16*	9
<i>A. laurussonii</i>	3	25	38	18	9			

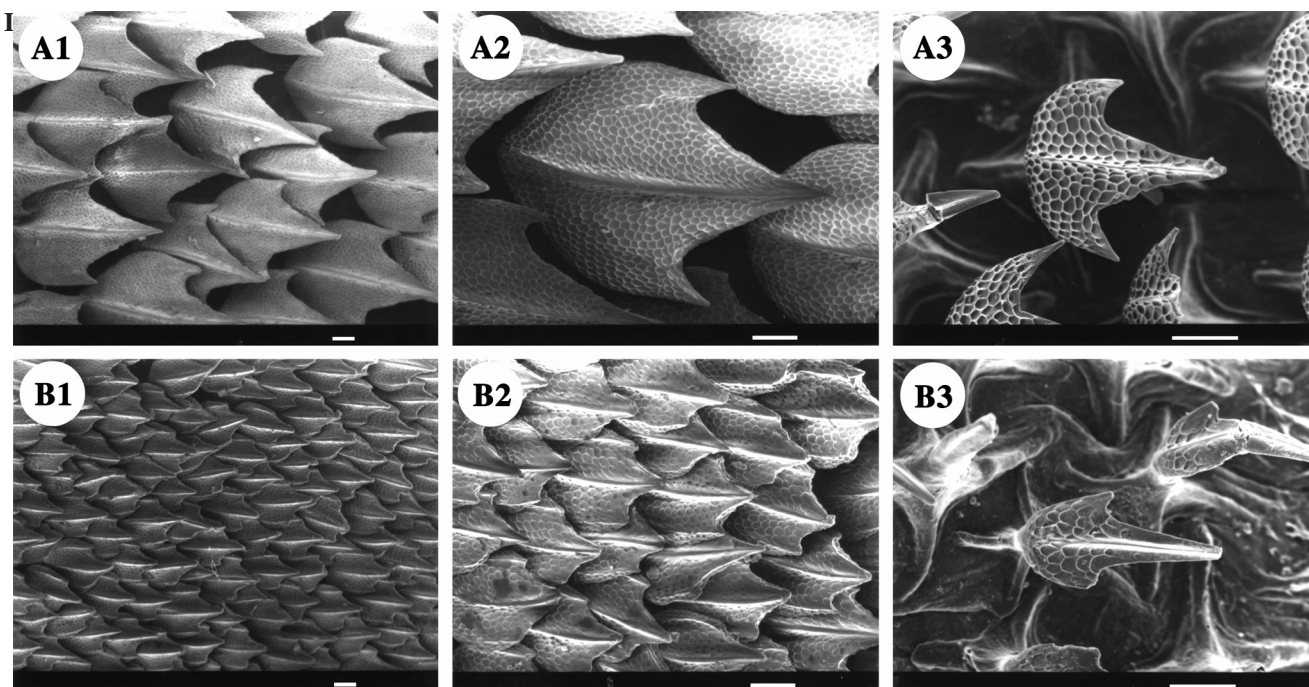


Figure 2. - Dermal denticles of *Apristurus melanoasper* n. sp. (A) and *A. laurussonii* (B). **A1** and **A2**: Paratype MNHN 1999-0780, mature male, 658 mm TL; **A3**: Paratype MNHN 2000-1756, immature male, 340 mm TL; **B1** and **B2**: MNHN 1999-0900, mature male, 710 mm TL; **B3**: MNHN 2000-1753, immature male, 200 mm TL. Scale bars = 100 μ m. [Denticules dermiques d'*Apristurus melanoasper* n. sp. (A) et *A. laurussonii* (B). **A1** et **A2** : Paratype MNHN 1999-0780, mâle mature, 658 mm TL ; **A3** : Paratype MNHN 2000-1756, mâle immature, 340 mm TL ; **B1** et **B2** : MNHN 1999-0900, mâle mature, 710 mm TL ; **B3** : MNHN 2000-1753, mâle immature, 200 mm TL. Échelle = 100 μ m.]

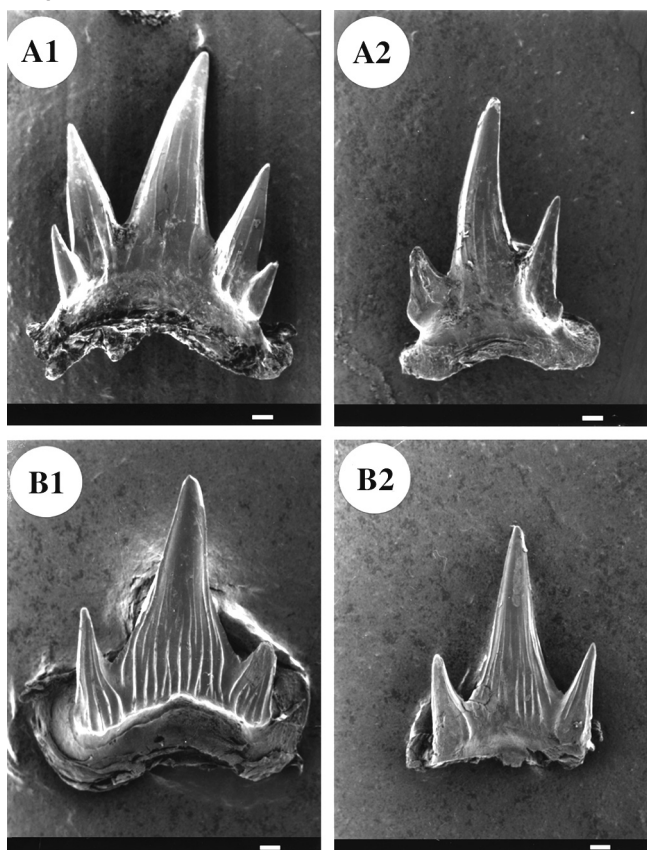


Figure 3. - Teeth of *Apristurus melanoasper* n. sp. (A) and *A. laurussonii* (B), from midlateral part of jaw. **A1** and **A2**: Upper and lower jaw teeth respectively, paratype MNHN 1999-0780, mature male, 658 mm TL; **B1** and **B2**: Upper and lower jaw teeth, MNHN 1999-0900, mature male, 710 mm TL. Scale bars = 100 μ m. [Dents d'*Apristurus melanoasper* n. sp. (A) et d'*A. laurussonii* (B), de la partie médio-latérale des mâchoires. **A1** et **A2** : Dents des mâchoires supérieure et inférieure, paratype MNHN 1999-0780, mâle mature, 658 mm TL ; **B1** et **B2** : Dents des mâchoires supérieure et inférieure, MNHN 1999-0900, mâle mature, 710 mm TL. Échelle = 100 μ m.]

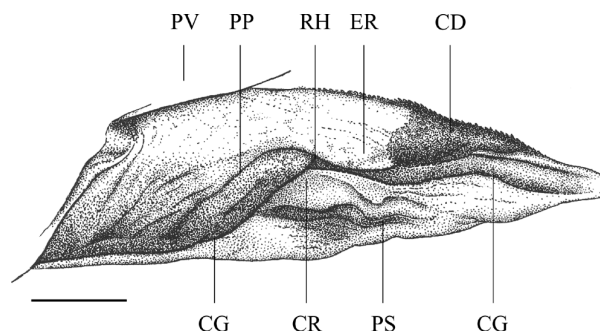


Figure 4. - Dorsal view of right clasper of *Apristurus melanoasper* n. sp., holotype MNHN 2000-1757, 718 mm TL. CD = clasper denticles; CG = clasper groove; CR = cover rhypidion; ER = exorhpidion; PP = pseudopoda; PS = pseudosiphon; PV = pelvic fin; RH = rhypidion. Scale bar = 0.5 cm. [Vue dorsale du ptérygopode droit d'*Apristurus melanoasper* n. sp., holotype MNHN 2000-1757, 718 mm TL. CD = denticules du ptérygopode ; CG = sillon du ptérygopode ; CR = couverture du rhypidion ; ER = exorhpidion ; PP = pseudopoda ; PS = pseudosiphon ; PV = nageoire pelvienne ; RH = rhypidion. Échelle = 0,5 cm.]

Table III. - Frequency distribution of monospondylous and precaudal diplospondylous vertebrae counts in *Apristurus melanoasper* n. sp. and *A. laurussonii*. Asterisk = holotype. Bold-faced numbers = higher frequencies. [*Distribution de fréquence des comptes de vertèbres monospondyles et diplospondyles d'Apristurus melanoasper* n. sp. et d'*A. laurussonii*. Astérisque = holotype. Nombres en caractères gras = plus hautes fréquences.]

	Monospondylous vertebrae count										Precaudal diplospondylous vertebrae count									
	36	37	38	39	40	41	42	43	44		26	27	28	29	30	31	32	33	34	35
<i>A. melanoasper</i> n. sp. (EN Atlantic)	2	2	6	8	7*	1		1			2	2	12	6*	4		1			
<i>A. melanoasper</i> n. sp. (WN Atlantic)			1	3	6	7	4					2	3	7	8	1				
<i>A. melanoasper</i> n. sp. (total)	2	3	9	14	14*	5		1			2	4	15	13*	12	1	1			
<i>A. laurussonii</i>						11	16	19*	3					2	6	6	14	11	6	2

References	Mothers		Egg capsules					
	TL	Weight	Length	Width post.	Width ant.	Width min.	Depth	Weight
MNHN 1999-0782	661	-	52	24.0	18	17	14	7.8
MNHN 2000-1754	732	1271	67	24.0	20	17	14	8.5
uncatalogued	-	-	55	23.5	20	19	14	7.5

Table IV. - Measurements (in mm) and weights (in g) of full egg capsules of *Apristurus melanoasper* n. sp. [*Mesures (en mm) et poids (en g) des capsules ovigères pleines d'Apristurus melanoasper* n. sp.]



Figure 5. - Egg capsule of *Apristurus melanoasper* n. sp., 67 mm in length, from paratype MNHN 2000-1754, 732 mm TL. Scale bar = 1 cm. [*Capsule ovigère d'Apristurus melanoasper* n. sp., 67 mm de long, provenant du paratype MNHN 2000-1754, 732 mm TL. Échelle = 1 cm.]

Distribution

Western North Atlantic slope, off northern United States and northern eastern North Atlantic, off France, Ireland and British Isles (Fig. 8) at 512 to 1520 m depth but generally deeper than 1000 m.

Etymology

This species is characterized by its black body colour and rough skin. The specific Latin name *melanoasper* refers to its black colouration (Greek: *melanos*) and rough (Latin: *asper*) skin. The French common name “holbiche noire” is from Quérou et al. (2003).

16S rRNA from a paratype of *Apristurus melanoasper* n. sp. (MNHN 2000-1755; GenBank No. AF329374) present 28 different nucleotides when aligned with the sequence of a specimen of *A. laurussonii* (MNHN 2000-1745; GenBank No. AF329376) (Fig. 14). The sequence obtained for *A. melanoasper* n. sp. appears to be species-specific.

Maturation and growth

Clasper (Fig. 6) is short in all specimens smaller than 520 mm TL, growing longer between 520 and 620 mm TL, and attaining its full length around 620 mm TL. Maturity indices (Fig. 7) indicate that this species attains sexual maturity between 610 and 640 mm TL for males, and between 550 and 590 for females. The smallest female with egg capsule was 661 mm TL. Specimens larger than 640 mm TL are all mature for both sexes. The largest male and female known are 761 and 732 mm TL, and weigh 1288 and 1275 g (with empty stomach), respectively.

DISCUSSION

Nakaya and Sato (1999) distinguished three species groups within the genus *Apristurus*: *brunneus* group, *spongiceps* group and *longicephalus* group. *Apristurus melanoasper* n. sp. belongs to the *brunneus* group, possessing a high spiral valve count and upper labial furrows definitely longer than lower ones. The *brunneus* group from the North Atlantic comprises *A. canutus*, *A. laurussonii* (synonyms: *A. atlanticus* and *A. maderensis*), and *A. parvipinnis*. *A. melanoasper* n. sp. is apparently different from *A. canutus* and *A. parvipinnis* in the western Atlantic in some features, e.g. 1st and 2nd dorsal fins of almost equal size (1st much smaller than 2nd dorsal fin in the latter two species), and long interspace between pectoral and pelvic fins, which is greater than anal fin base length (short and less than anal fin base). Therefore, we compare in detail *A. melanoasper* n. sp. with only *A. laurussonii*.

Proportional measurements: morphometric measurements for *A. melanoasper* n. sp. are given in table I. The distance from snout tip to pelvic fin origin is longer in *A. melanoasper* n. sp. than in *A. laurussonii* ($45.6 \pm 1.8\%$ TL versus $41.4 \pm 2.2\%$ TL); that between pectoral fin insertion and pelvic fin origin is longer in *A. melanoasper* n. sp. than in *A. laurussonii* ($17.5 \pm 2.1\%$ TL versus $13.7 \pm 1.4\%$ TL); that between pectoral fin tip and pelvic fin origin is longer in *A. melanoasper* n. sp. than in *A. laurussonii* ($12.4 \pm 1.9\%$ TL versus $7.1 \pm 1.7\%$ TL); that between pectoral and pelvic fin origin is longer in *A. melanoasper* n. sp. than in *A. laurussonii* ($24.5 \pm 1.9\%$ TL versus $20.5 \pm 1.8\%$ TL). These facts prove that the new species possesses more widely separated pectoral and pelvic fins than *A. laurussonii*.

The pectoral fin is narrower in *A. melanoasper* n. sp. than in *A. laurussonii* ($6.8 \pm 0.6\%$ TL versus $8.3 \pm 0.7\%$ TL). These

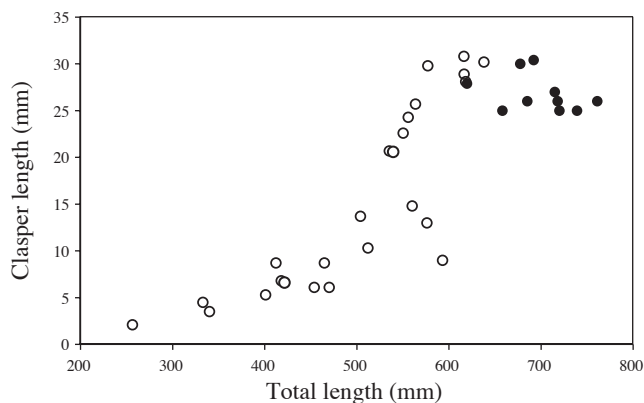


Figure 6. - Development of claspers in *Aristurus melanoasper* n. sp. ● = specimens with developed testes, ○ = specimens with undeveloped or developing testes. [Développement des ptérygopodes d'*Aristurus melanoasper* n. sp. ● = spécimens aux testicules développés, ○ = spécimens aux testicules non développés ou en développement.]

two species are clearly distinguished by the combination of these characters, i.e. distance from the pectoral fin tip to pelvic fin/pectoral fin width, which is 1.3 to 2.5 in *A. melanoasper* n. sp., whereas only 0.5 to 1.3 in *A. laurussonii* (Figs 9, 10).

In addition, *A. melanoasper* n. sp. has smaller eyes than *A. laurussonii*, especially when their horizontal diameter is compared with interorbital space. Eye diameter is mostly less than half of interorbital space in *A. melanoasper* n. sp., but it is more than half in *A. laurussonii*, except in specimens smaller than 250 mm TL (Figs 11, 12).

Teeth. - Tooth row count of *A. melanoasper* n. sp. shows a large variability that can be related to ontogeny. The count

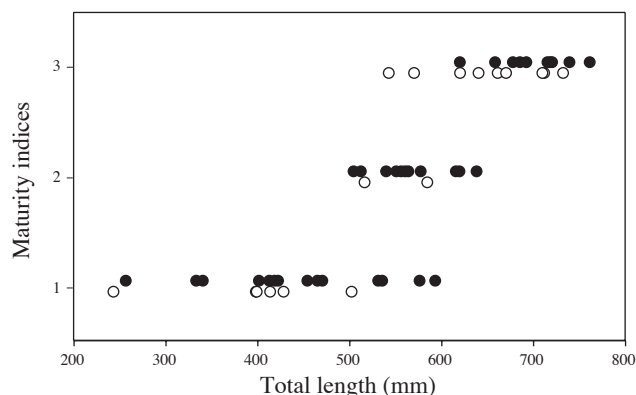


Figure 7. - Maturity indices in *Aristurus melanoasper* n. sp. ● = males, ○ = females. Maturity index: 1 = immature (claspers short, or gonads undeveloped); 2 = adolescent (claspers extending but soft, or gonads developing); 3 = adult (clasper long and stiff, or gonads completely developed). [Indices de maturité d'*Aristurus melanoasper* n. sp. ● = mâles, ○ = femelles. Indice de maturité : 1 = immature (ptérygopodes courts, ou gonades non développées); 2 = adolescent (ptérygopodes en croissance mais souples, ou gonades en développement); 3 = adulte (ptérygopodes longs et rigides, ou gonades complètement développées).]

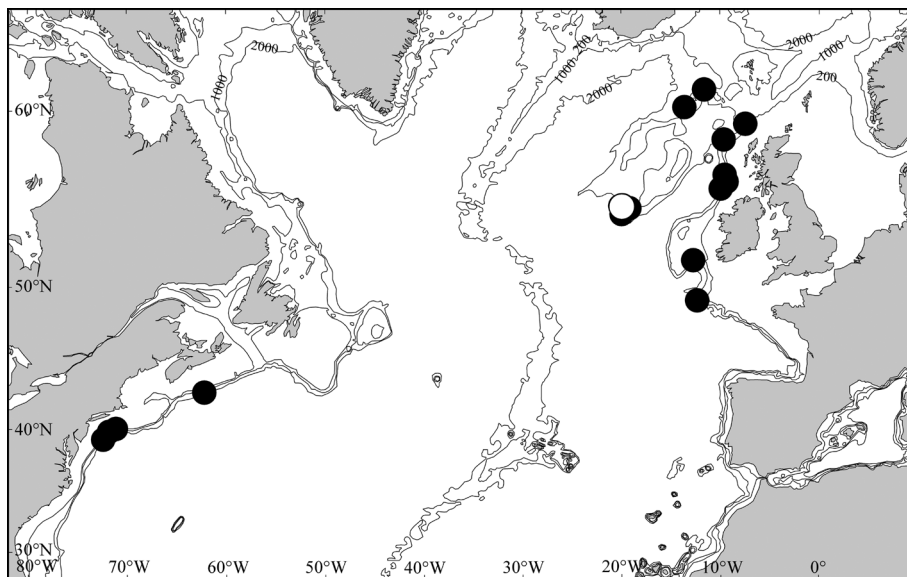


Figure 8. - Capture localities of *Aristurus melanoasper* n. sp. in the North Atlantic (●); ○ = holotype. [Localités de capture d'*Aristurus melanoasper* n. sp. dans l'Atlantique Nord (●); ○ = holotype.]

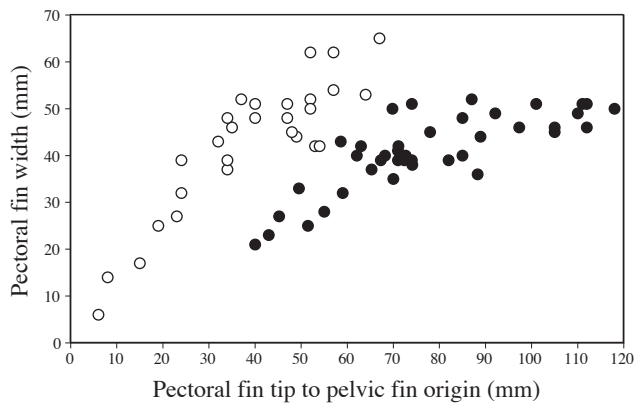


Figure 9. - Relation of distance from pectoral fin tip to pelvic fin origin and pectoral fin width in *Apristurus melanoasper* n. sp. (●) and *A. laurussonii* (○). [Relation entre la distance de l'extrémité de la nageoire pectorale à l'origine de la nageoire pelvienne et la largeur de la nageoire pectorale d'*Apristurus melanoasper* n. sp. (●) et d'*A. laurussonii* (○).]

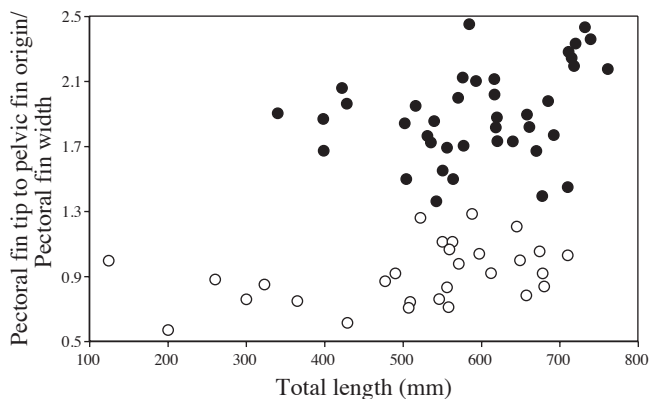


Figure 10. - Ratio of pectoral fin tip to pelvic fin origin/pectoral fin width in *Apristurus melanoasper* n. sp. (●) and *A. laurussonii* (○). [Ratio de la distance entre l'extrémité de la nageoire pectorale et l'origine de la nageoire pelvienne et la largeur de la nageoire pectorale d'*Apristurus melanoasper* n. sp. (●) et d'*A. laurussonii* (○).]

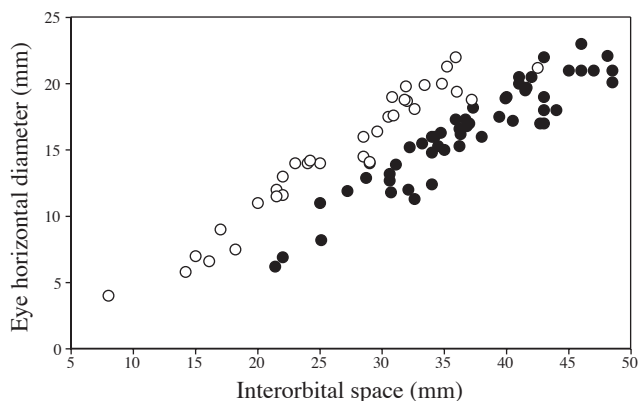


Figure 11. - Relation of interorbital space and eye horizontal diameter in *Apristurus melanoasper* n. sp. (●) and *A. laurussonii* (○). [Relation entre l'espace inter-orbitaire et le diamètre horizontal de l'œil d'*Apristurus melanoasper* n. sp. (●) et d'*A. laurussonii* (○).]

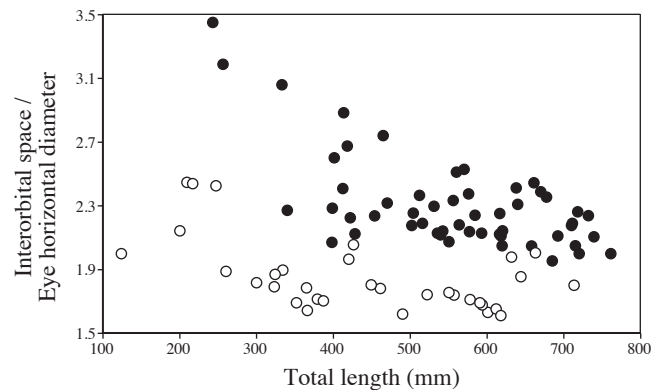


Figure 12. - Ratio of interorbital space/eye horizontal diameter for *Apristurus melanoasper* n. sp. (●) and *A. laurussonii* (○). [Ratio de l'espace inter-orbitaire/diamètre horizontal de l'œil d'*Apristurus melanoasper* n. sp. (●) et d'*A. laurussonii* (○).]

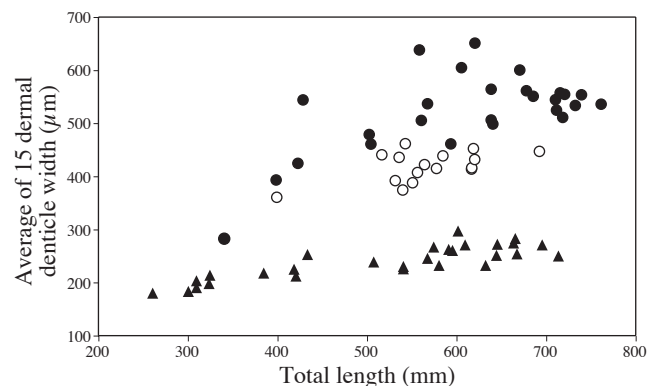


Figure 13. - Widths of dermal denticles (average of fifteen denticles) in *Apristurus melanoasper* n. sp. (● = specimens from eastern North Atlantic, ○ = specimens from western North Atlantic) and *A. laurussonii* (▲). [Largeurs des denticules dermiques (moyenne sur quinze denticules) d'*Apristurus melanoasper* n. sp. (● = spécimens de l'Atlantique Nord-Est, ○ = spécimens de l'Atlantique Nord-Ouest) et d'*A. laurussonii* (▲).]

tends to increase with growth as in *A. laurussonii* (Iglésias and Nakaya, 2004).

Dermal denticles. - *A. melanoasper* n. sp. has extremely large dermal denticles. The width ranges from 0.3 to 0.7 mm in *A. melanoasper* n. sp. but is only about 0.2 mm in *A. laurussonii* (Fig. 13). Therefore, the skin is very rough to touch in *A. melanoasper* n. sp. but is quite smooth to touch in *A. laurussonii*.

Meristic count. - Spiral valve count (Tab. II) is higher in *A. melanoasper* n. sp. with 19 to 23 turns (mostly 21 or 22) than in *A. laurussonii* with 16 to 20 turns (mostly 17 to 19). Vertebral count is lower for *A. melanoasper* n. sp. with 36 to 43 monospondylous and 26 to 32 precaudal diplospondylous vertebrae (mostly 38 to 40 and 28 to 30) than for *A. laurussonii* with 41 to 44 monospondylous and 29 to 35 precaudal diplospondylous vertebrae (mostly 42 or 43 + 31 to 33).

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1  TGTACTGGAA  AGTGCACCTTG  GAATCAAAAT  GTGGCTAAAT  TAGTAAAGCA  CCTCCCTTAC  ACCGAGGA  A  TACCCGTGCA  ATTCGAGTCA  TTTTGAACCT
101 TAAACTAGC  CTAA  TACCA  ATTTAACTAA  ACCTTATTAA  TTTAATTTAC  ACTAAACCT  TTACTTAAAA  CATTTTAACC  TTTTAGTATG  GGCGACAGAA
201 AAAACCTCA  GCGCAATAAC  TTAAGTACCG  CAAGGGAAGA  CTGAAAAAGA  AATGAAATAA  ATCATTAAAG  TACTAAAAAG  CAGAGACACC  CCCTCGTACC
301 TTTTGCATCA  TGGTTTAGCT  AGAAAAACTA  GGCAAAAGA  CTTTAAGTCT  ACCTCCCGA  AACTAAACGA  GCTACTTCGA  AGCAGCATTA  TTAGAGCCAA
401 CCCGTCTCTG  TGGCAAAAGA  GTGGGAAGAC  TTCCAAGTAG  CGGTGAAAG  CCTACCGAGT  TTAGTGATAG  CTGGTTGCC  AAAAAAGAA  CTTAAGTTCT
501 GCATTAATTT  TTAATAACTA  AACAGATCT  CCTTATCAAA  GTAATATATA  AGAATTAATA  GTTATTTAGA  AGAGGTACAG  CCCTTCTAAA  TTAAGATACA
601 ACTTTCTAAG  GTGGGAAATG  ATCATAATTA  TTAAGGCTTT  CTCCCGAGTG  GGCCTAAAG  CAGCCACCTG  TAAAGCAAGC  GTCGCAGCTC  CAGCCTTACA
701 AAAGCCAATA  ATTTAGATAT  TTACTCATAA  CCCCTTAAC  ACTATTGGGC  TATTTTATAA  AATTATAAAA  GAACTTATGC  TAAAAAGAGT  AATAAGAGAA
801 TAAACCTCTC  CCGACACAAG  TGTATGTCAG  AAAGAATTAA  ATCACTGATA  ATTAAACGAC  CCCAACTGA  GGACATCATA  GACTTATATA  ATTAAGTAGA
901 AAACCTTATT  TTATAACTCG  TTAATCTTAC  ACAGGCGTGT  CTTAAGGAAA  GATTAAAGA  AAGTAAAGGA  ACTCGGCAAA  CACAACTCC  GCCTGTTTAC
1001 CAAAAACACC  GCCTCTTGCT  AAACCTATAAG  AGGTCCCGCC  TGCCCTGTGA  CAATGTTCAA  CGGCCGCGGT  ATTTTGACCG  TGCAAAGGTA  GCGTAATCAC
1101 TTGTCTTTTA  AATGAAGACC  CGTATGAAAG  GCACCACGAG  AGTTTAACTG  TCTCTATTTT  CTAATCAATG  AAATTGATCT  ATTCGTGCAG  AAGCGAATAT
1201 AATAACATTA  GACGAGAAGA  CCCTATGGAG  CTTCAAACAC  TTAGACTAAT  TATGTAAAT  TTTTACCCTG  CGGGCAAAAA  CAAAAATACA  ATACTTCTAG
1301 TTTGACTGTT  TTTGGTTGGG  GTGACCAAGG  GGTAAACAA  AACCCCTTA  TCGACCGAAC  ACTTAGTGTT  TAAAAATTAG  AATGACAATT  CTAATTAATA
1401 AAACATTAT  CGAAAAATGA  CCCAGGATTT  CCTGATCAAT  GAACCAAGTT  ACCCTAGGGA  TAACAGCGCA  ATCCTTTCCC  AGAGTTCCCTA  TCGACGAAAG

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Figure 14. - Alignment of 1,500 bp of the mitochondrial genome of *Apristurus melanoasper* n. sp. (upper sequence, GenBank number: AF329374, specimen reference: MNHN 2000-1755, paratype) and *A. laurussonii* (lower sequence, Genbank number: AF329376, specimen reference: MNHN 2000-1745). The DNA sequences are from the position 14854 to 16362 (using the complete mitochondrial genome of *Scyliorhinus canicula* as reference, GenBank number: Y16067); they include partial sequence of the gene coding the 12S rRNA, sequence of the Valine tRNA and partial sequence of the 16S rRNA. [Alignement de 1500 bp du génome mitochondrial d'*Apristurus melanoasper* n. sp. (séquence du haut, numéro GenBank : AF329374, spécimen de référence : MNHN 2000-1755, paratype) et d'*A. laurussonii* (séquence du bas, numéro Genbank : AF329376, spécimen de référence : MNHN 2000-1745). Les séquences ADN incluent les positions 14854 à 16362 (utilisant le génome mitochondrial de *Scyliorhinus canicula* comme référence, numéro GenBank : Y16067) ; elles comprennent une séquence partielle du gène codant l'ARNr 12S, la séquence de l'ARNt Valine et la séquence partielle de l'ARNr 16S.]

Tooth row count is lower for *A. melanoasper* n. sp. with maximum of 93 in the upper and 97 in the lower jaw, versus 102 in the upper and 106 in the lower jaw for *A. laurussonii*.

Egg capsule. - Egg capsule of *A. melanoasper* n. sp. is distinct from that of *A. laurussonii* by presence of prominent horns at anterior corners, concave anterior margin, posterior tendrils joining at base, absence of long fibrous threads at anterior corners. Egg capsule of *A. laurussonii* is characterized by absence of horns at anterior corners, convex anterior end, posterior tendrils separated at base, presence of long weak fibrous threads at anterior corners, and surface with a suede-like texture. Presence of a single egg capsule per oviduct suggests *A. melanoasper* n. sp. is probably a single oviparous species, as supposed throughout the genus (Iglésias *et al.*, 2002).

Colour. - Upper and lower surfaces of body and fins are uniformly black, but smaller specimens are still dark grey in *A. melanoasper* n. sp. In contrast, body and fins in *A. laurus-*

sonii are uniformly grey. A small white spot is present on dorsal margin of posterior tip of caudal fin in most specimens of *A. melanoasper* n. sp., but is absent in *A. laurussonii*.

Maturation. - Maturity of females is attained at a smaller size than for males (Fig. 7), whereas it is generally the opposite for sharks. Possibly this uncommon result can be due to the small number of specimens sampled and/or differences between populations and/or significant modification of the size depending on whether the specimen is preserved or fresh when measured. For this reasons more investigations are needed to conclude about size of maturity of *A. melanoasper* n. sp.

Sexual dimorphism. - Adult females have a wider head than adult males, with wider interorbital space and wider mouth. Females have a larger number of lateral cusps on teeth than males. The same dimorphism was previously noticed for *A. laurussonii* (Iglésias and Nakaya, 2004).

Molecular differences. - DNA sequences of 1500 bp of the partial 12S rRNA, Valine tRNA and partial 16S rRNA are aligned for a specimen of *A. melanoasper* n. sp. and a specimen of *A. laurussonii* (Fig. 14) originating from the same area (eastern North Atlantic). Generally no intraspecific variability is observed for this mitochondrial fragment for specimens from the same area, or the variability does not exceed two mutations for the studied sequence (Iglésias, unpubl. data). Twenty-eight differences are observed between the sequences of *A. melanoasper* n. sp. and *A. laurussonii*. These molecular results clearly indicate that *A. melanoasper* n. sp. and *A. laurussonii* are different species. Molecular phylogenetic inferences for 18 species of *Apristurus*, using the same DNA sequence (Iglésias *et al.*, in press) suggest that *A. laurussonii* is closest to *A. melanoasper* n. sp., as suggested also by morpho-anatomical comparisons.

Intraspecific comparison, European versus American *A. melanoasper* n. sp.

The 31 specimens of *A. melanoasper* n. sp. from European waters were analyzed separately from 23 specimens from American waters. No significant differences were observed for proportional measurements, so data were treated together (Tab. I). Small differences are observed in the spiral valve count (Tab. II) and the vertebral count (Tab. III). European specimens tend to have a smaller number of spiral valves and a smaller number of precaudal diplospondylous vertebrae than American specimens. The most significant difference observed is the size of dermal denticles (Fig. 12). European specimens have larger dermal denticles than American specimens, but the shape and ornamentation of denticles are identical. As most of the characters and all of the measurements do not present differences between European and American specimens and because the differences show morphocline, we consider that these differences are not sufficient to separate the two groups of specimens as two distinct species. We consider these two groups of specimens as two populations (European and American) of the same species.

Conclusively as discussed above, we have found some distinct morphological and molecular differences between *A. melanoasper* n. sp. and *A. laurussonii*, confirming *A. melanoasper* n. sp. as a new species of the genus *Apristurus*. We consider the differences observed between the European and the American populations of *A. melanoasper* n. sp. could attest of the first step for a process of allopatric speciation within the species, but more investigation, including molecular analysis would be necessary to confirm it.

KEY TO NORTH ATLANTIC SPECIES OF *APRISTURUS*

- 1a.** Spiral valve count 8-12; upper labial furrow equal to or shorter than lower labial furrow (*spongiceps* group)
.....
A. aphodes, *A. manis*, *A. microps* (*sensu* Compagno, 1984),
.....*A. profundorum*, *A. riveri*
- 1b.** Spiral valve count 14-23; upper labial furrow longer than lower labial furrow (*brunneus* group)2
- 2a.** First dorsal fin half the size of second dorsal fin
.....*A. canutus*, *A. parvipinnis*
- 2b.** First dorsal fin equal to or only little smaller than second dorsal fin.....3
- 3a.** Distance from pectoral fin tip to pelvic fin origin 0.5-1.3 times pectoral fin width; skin smooth with small dermal denticles; body and fins brownish grey*A. laurussonii*
- 3b.** Distance from pectoral fin tip to pelvic fin origin 1.3-2.5 times pectoral fin width; skin very rough with large dermal denticles; body and fins blackish.....*A. melanoasper* n. sp.

Comparative material. - *Apristurus atlanticus* (Koefoed, 1927).

Holotype. - ZMUB 3203, immature male, 247 mm total length (TL), "Michael Sars" expedition, station 41, 23 May 1910, off Canary Islands, 28°08'N, 13°35'W, 1365 m depth.

Apristurus laurussonii (Saemundsson, 1922). 132 specimens (45 catalogued, 87 uncatalogued). Holotype. - NHMR (no catalogue number), mature female, 663 mm TL, 15 Jul. 1915, off Vestmannaeyjar Island, 560 m. Forty four catalogued specimens, males and females, 124 to 713 mm TL; MNHN 2003-1070, 1987-0965, 1989-0680, 1999-0900, 1999-0904 to 1999-0906, 1999-0912, 1999-0915 to 1999-0917, 1999-0919 to 1999-0924, 1999-0926, 1999-0928, 1999-0930, 1999-0931, 1999-0937, 2000-1745, 2000-1746, 2000-1748 to 2000-1753; HUMZ 156759 to 156761; IOS Sm13, 9008, 9018, 11543; ISH 51/1965, 70/1965, 23/1981, 109/1981 and 1052/1982; from South Iceland, West of British Isles, West of France, off Canary Islands and off Mauritania. Eighty seven uncatalogued specimens that were studied mainly for biological examination, males and females, 292 to 734 mm TL, West of British Isles.

Acknowledgements. - We are grateful to M.-H. Du Buit (CNRS-MNHN, Concarneau) for help in collecting specimens and during the study; D. Sellos (CNRS-MNHN, Concarneau) for help in sequence analyses; B. Séret (IRD-MNHN, Paris) for help during the study; P. Lorance (IFREMER, Boulogne), J.-C. Quérou (IFREMER, La Rochelle), R. Causse (MNHN, Paris), M. Girard (PROMA, Lorient), and P. Crozier (Dunstaffnage Marine Laboratory), for collecting several specimens; H. Wilkens and G. Schulze (ZMH) for loan, X-ray and cataloguing of ISH collection; K. Sato (Okinawa Churaumi Aquarium), for data on comparative material; P. Pruvost (MNHN, Paris) for cataloguing specimens; fishermen of the trawlers "Croix Morand" and "Ronsard" for their help on board; "Dhellemmes" and "Nicot" ship's managers for permitting participation in cruises on their boats.

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Reçu le 23 février 2004.

Accepté pour publication le 24 juin 2004.